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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/038,344	01/02/2002	Bin Zhang	10013656 -1	6914
7590	04/21/2006		EXAMINER	
HEWLETT-PACKARD COMPANY			ERB, NATHAN	
Intellectual Property Administration			ART UNIT	PAPER NUMBER
P.O. Box 272400				
Fort Collins, CO 80527-2400			3639	

DATE MAILED: 04/21/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/038,344	ZHANG ET AL.	
	Examiner	Art Unit	
	Nathan Erb	3639	

– The MAILING DATE of this communication appears on the cover sheet with the correspondence address –
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) Responsive to communication(s) filed on _____.
- 2a) This action is **FINAL**. 2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) Claim(s) _____ is/are allowed.
- 6) Claim(s) 1 and 5-20 is/are rejected.
- 7) Claim(s) 2-4 is/are objected to.
- 8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on 20 March 2006 is/are: a) accepted or b) objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) All b) Some * c) None of:
 1. Certified copies of the priority documents have been received.
 2. Certified copies of the priority documents have been received in Application No. _____.
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) <input type="checkbox"/> Notice of References Cited (PTO-892)	4) <input type="checkbox"/> Interview Summary (PTO-413)
2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)	Paper No(s)/Mail Date. _____.
3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.	5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)
	6) <input type="checkbox"/> Other: _____.

DETAILED ACTION

Response to Arguments

1. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.
2. Applicants' response to Office action was received on March 20, 2006.
3. Based on applicants' arguments and claim amendments, all of the 35 USC § 112 rejections based on lack of antecedent basis have been withdrawn.
4. The remaining 35 USC § 112 rejections (those not based on lack of antecedent basis) have not been withdrawn. Applicants' arguments were not persuasive for the following reasons. Claims should be interpreted in view of the specification without unnecessarily importing limitations from the specification into the claims. E-Pass Technologies Inc. v. 3Com Corp., 67 USPQ2d 1947, 1950 (Fed. Cir. 2003). Applicants argue that several of the terms at issue in the remaining 35 USC § 112 rejections are in fact defined in the specification. This is not the case, however.

Specifically, applicants state that the term "geometric calculation" is defined starting on p. 19, line 1. The exact language there is "Referring now to step 504, a geometric calculation is performed using the first price to determine additional prices. More particularly a geometric calculation is performed to determine a number of additional prices such that the total number of prices equals the number of prices provided in step 502." This passage does not define the term "geometric calculation;" rather, it simply refers to the calculation being described as a type of geometric calculation.

With respect to the term “geometric error,” applicants state that “geometric error” is defined in the specification, beginning on p. 19, line 1. The exact language there is “In the present embodiment, geometric error is the amount by which a geometric intersection of lines deviates from zero units (i.e., the x-axis) which is indicated as number of units of deviation.” While this statement effectively defines geometric error somewhat, it does so only with respect to one embodiment of applicants’ invention. Therefore, it does not provide a full definition of “geometric error.”

Regarding the term “vertical reference line,” applicants argue that the vertical reference line can be any vertical line in accordance with embodiments of the present invention as described in the specification. However, as mentioned above, claims should be interpreted in view of the specification without unnecessarily importing limitations from the specification into the claims. In this case, using the specification to provide the information regarding vertical reference line needed in the claims would be unnecessarily importing limitations from the specification into the claims.

Regarding the term “additional price that corresponds to the intersection,” applicants argue that the additional price that corresponds to the intersection can be any additional price in accordance with embodiments of the present invention as described in the specification. However, as mentioned above, claims should be interpreted in view of the specification without unnecessarily importing limitations from the specification into the claims. In this case, using the specification to provide the information regarding additional price that corresponds to the intersection needed in the claims would be unnecessarily importing limitations from the specification into the claims.

Regarding the term “reference line,” applicants argue that the reference line can be any reference line in accordance with embodiments of the present invention as described in the specification. However, as mentioned above, claims should be interpreted in view of the specification without unnecessarily importing limitations from the specification into the claims. In this case, using the specification to provide the information regarding the reference line needed in the claims would be unnecessarily importing limitations from the specification into the claims.

In addition, applicants request that the 35 USC § 112 rejection for claim 1 be removed, noting that the claim has been amended to change the steps of “calculating” the first and second angles to the steps of “accessing” the first and second angles. However, those amendments have not corrected the problems with claim 1 addressed in the 35 USC § 112 rejection of claim 1. The problem with claim 1 is that it omits the steps of determining the position of the first reference line and determining the position of the second reference line. These steps are essential because without determining the positions of these lines, as well as knowing how to determine them, it is impossible to determine the size of the two angles, which is necessary to determine if the angles are equal to one another, a claimed step of step 1. The omission of those steps amounts to a gap between the steps.

For a full description of the remaining 35 USC § 112 rejections, please see the 35 USC § 112 rejection section below.

5. Regarding applicants’ response to the 35 USC § 101 rejection for claims 1, 5, and 8-15, the rejection is not referring to a requirement that the claims be limited by language within the technological arts. Rather, the rejection is explaining that the claim involving a mathematical

algorithm does not produce a tangible result, as required by the case law cited in the rejection.

Applicants also argue that the claims are not directed toward laws of nature, natural phenomena, and abstract ideas. However, the Office action notes that the claims involve a mathematical algorithm, and a mathematical algorithm which does not produce a useful, concrete, and tangible result is an abstract idea. Please refer to the full rejection under the 35 USC § 101 rejection section below for further explanation.

6. In light of applicants' response to the 35 USC § 101 rejection for claims 8-10, the original 35 USC § 101 rejection for claims 8-10 (section 17 of the first Office action) is hereby withdrawn. However, there is a new 35 USC § 112, 1st paragraph, rejection for claims 8-10. Please refer to the 35 USC § 112 rejection section below for further explanation.

7. Regarding applicants' arguments concerning all of the rejections under 35 USC § 103, applicants' arguments have been found to be persuasive. Therefore, all of the rejections under 35 USC § 103 have been withdrawn.

Drawings

8. The drawings were received on March 20, 2006. These drawings are acceptable.

Specification

9. The amendments to the specification and abstract were received on March 20, 2006. The objections to the specification and abstract are hereby withdrawn.

Claim Objections

10. The amendments to the claims were received on March 20, 2006. The objections to claims 3 and 5 from the first Office action are hereby withdrawn.

Claim Rejections - 35 USC § 112

11. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

12. Claims 8-10 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. Although claims 8-10 are indefinite, they appear to be attempts to claim the method 800, so for examination purposes, they will be treated as if they were definite claims to method 800. Unfortunately, method 800 is not described in the specification in such a way as to enable one skilled in the art to make and/or use the invention. Method 800 is described in pp. 26-32 of applicants' specification, some of which has been amended. The problem with the description of method 800 is that it does not describe how to use method 800 with respect to the demand curves for which only one additional price is found using the initial price p_0 , that is, those demand curves for which method 100 is used. For example, would the diagonal reference line used to calculate p_1 still be drawn through the origin?

Without this description, the disclosure of method 800 is incomplete and does not enable one skilled in the art to make or use the invention to which it pertains. Therefore, claims 8-10 are rejected under 35 USC 112, first paragraph.

13. Claim 1 is rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential steps, such omission amounting to a gap between the steps. See MPEP § 2172.01. The omitted steps are: determining the position of the first reference line and determining the position of the second reference line. These steps are essential because without determining the positions of these lines, as well as knowing how to determine them, it is impossible to determine the size of the two angles, which is necessary to determine if the angles are equal to one another, a claimed step of step 1.

14. Claim 5 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The terms that render claim 5 indefinite are “geometric calculation” and “geometric error.” These terms render claim 5 indefinite because it is not clear just how the geometric calculation is performed or how the geometric error is determined.

15. Claims 6, 12, 14, 15, and 18 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Several phrases render claims 6, 12, and 18 indefinite. “[D]etermining the location of a second reference line” renders claims 6, 12, and 18 indefinite because it is not clear how the location of a second reference line is determined. “[D]etermining where said second reference line intersects a vertical reference line” renders claims 6, 12, and 18 indefinite because the location of the vertical reference line used is not stated. “[C]alculating an

additional price that corresponds to the determined intersection between said second reference line and said vertical reference line" renders claims 6, 12, and 18 indefinite because the way in which the additional price corresponds to the intersection is not stated. For example, does the additional price lie on the same horizontal line or the same vertical line from the intersection? Thus, there is not enough information to calculate the additional price. Since claim 6 is dependent on claim 5, the fact that there is still no information on how to determine geometric error renders claim 6 indefinite. Since claim 12 is dependent on claim 11, the fact that claim 11 does not describe how to determine geometric error renders claim 12 indefinite. Since claim 18 is dependent on claim 16, the fact that claim 16 does not describe how to determine geometric error renders claim 18 indefinite. Claim 14 depends on claim 12, and thus all of the reasons for this claim 12 rejection apply to claim 14, since claim 14 has no language that remedies those problems in claim 12. Claim 15 depends on claim 12, and thus all of the reasons for this claim 12 rejection apply to claim 15. Claim 15's directions on locating the vertical reference line do not completely resolve claim 12's problem regarding locating the vertical reference line because claim 15 does not describe how to locate the vertical reference line for determining a third and later prices.

16. Claims 7 and 13 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The phrase "first reference line" renders claims 7 and 13 indefinite because the claims never fully define where the first reference line is located. Therefore, it would be impossible to determine the angles between the second reference line and the first reference line and between the tangent line and the first reference line, as the claims require. In

addition, since claim 7 is dependent on claim 6, all of the reasons for claim 6 being indefinite apply to claim 7, with the exception of the reason concerning the location of the second reference line. Also, since claim 13 depends on claim 12, all of the reasons for claim 12 being indefinite apply to claim 13, with the exception of the reason concerning the location of the second reference line.

17. Claims 8 and 10 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The step of “determining additional prices that maximize revenue for each product” renders claims 8 and 10 indefinite because the claims do not state how those prices that maximize revenue are determined. This rejection applies to claim 10 because claim 10 depends on claim 8 and claim 10 adds no language that remedies the problems of claim 8.

18. Claim 9 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claim 9 is rendered indefinite by the phrases “geometric calculation” and “geometric error” because the claim does not describe either how the geometric calculation is performed or how the geometric error is determined.

19. Claims 11, 16, and 17 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The phrases which render claims 11 and 16 indefinite are “geometric calculation” and “geometric error” because the claims do not describe how the geometric calculation is performed or how the geometric error is determined. Claim 17 is

dependent on claim 16 and has no language that remedies these problems in claim 16.

Therefore, claim 17 is indefinite for the same reasons as claim 16.

20. Claim 19 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The phrase “first reference line” renders claim 19 indefinite because the claim never fully defines where the first reference line is located. Therefore, it would be impossible to determine the angles between the second reference line and the first reference line and between the tangent line and the first reference line, as the claim requires. In addition, since claim 19 is dependent on claim 16, all of the reasons for claim 16 being indefinite apply to claim 19.

21. Claim 20 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Since claim 20 is dependent on claim 16, all of the reasons for claim 16 being indefinite apply to claim 20.

Claim Rejections - 35 USC § 101

22. Claims 1, 5, and 8-15 are rejected under 35 U.S.C. 101 because the claimed inventions are directed to non-statutory subject matter. In order to be patentable, an invention involving a mathematical algorithm must produce a useful, concrete, and tangible result. State Street Bank & Trust Co. v. Signature Financial Group Inc., 47 USPQ2d 1596, 1600-1601 (Fed. Cir. 1998). The inventions of these claims do not produce tangible results, for example, some sort of perceivable communication that transmits its calculated price to a user. This could be a step producing a chart, printout, or computer monitor display; however, there are no such outputs in these claims. Therefore, these claims do not produce tangible results and are not patentable.

Allowable Subject Matter

23. Claims 2-4 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Suggestions

24. In order to aid the applicants in responding to the 35 USC § 112 and 35 USC § 101, notwithstanding tangible rejections above, the following forms for claims are suggested:

For the single-price embodiment:

A method for determining a price that maximizes revenue comprising:
providing a demand curve with an x-axis and a y-axis;
choosing a test price corresponding to a point on said demand curve;
defining a first reference line which is the horizontal line that passes through said point of said test price;
defining a second reference line which passes through both the origin of said x-axis and said y-axis and said point of said test price;
calculating the size of a first angle, said size of said first angle calculated by determining the size of the angle between said first reference line and said second reference line;
calculating the size of a second angle, said size of said second angle calculated by determining the size of the angle between said first reference line and a line tangent to the demand curve at said point of said test price;
determining whether said first angle is equal to said second angle;

repeating said above steps of choosing a test price, defining a first reference line, defining a second reference line, calculating the size of a first angle, calculating the size of a second angle, and determining whether said first angle is equal to said second angle until a test price is found at which said first angle is equal to said second angle, at which point said most recent test price is determined to be the price that maximizes revenue; and
outputting said price that maximizes revenue in a tangible form which is a communication perceivable to a user of said method.

For the multiple-price embodiment:

A method for determining prices that maximize revenue comprising:
providing a demand curve with an x-axis and a y-axis;
providing a number of prices to be determined for said demand curve;
choosing a test price corresponding to a point on said demand curve;
defining a first reference line which is the horizontal line that passes through said point of said test price;
determining a first angle, said first angle being the angle between said first reference line and a line tangent to the demand curve at said point of said test price;
defining a second reference line which is the line which forms a second angle with said first reference line that is on the opposite side of said first reference line from said first angle and equal to said first angle;
determining a vertical reference line, which is said y-axis for the first test price of an iteration of said method or the vertical line that passes through the point of the immediately previous test price of the current iteration of said method for later test prices of an iteration of said method;

determining an intersection point between said second reference line and said vertical reference line;

determining a next test price, which is the test price corresponding to where a horizontal line at said intersection point intersects with said demand curve;

repeating said above steps of defining a first reference line, determining a first angle, defining a second reference line, determining a vertical reference line, determining an intersection point, and determining a next test price until the total number of test prices for the demand curve for that particular iteration of said method is equal to said number of prices to be determined for said demand curve;

calculating an error value, which is the distance between the intersection point that would have been established for the last test price of the iteration of said method had the iteration continued and the x-axis;

performing additional iterations of said method, comprising repeating the above steps of choosing a test price, defining a first reference line, determining a first angle, defining a second reference line, determining a vertical reference line, determining an intersection point, determining a next test price, repeating said above steps, and calculating an error value until an error value is found which is less than a predetermined value, at which point the set of test prices for the most recent iteration of said method is determined to be the prices that maximize revenue; and

outputting said prices that maximize revenue in a tangible form which is a communication perceivable to a user of said method.

Conclusion

25. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Nathan Erb whose telephone number is (571) 272-7606. The examiner can normally be reached on Mondays through Fridays, 8:30 AM to 5 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John Hayes can be reached on (571) 272-6708. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Nathan Erb
Examiner
Art Unit 3639

nhe



JOHN W. HAYES
SUPERVISORY PATENT EXAMINER